



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,570	05/05/2006	Stanko Hocevar	289485US0X PCT	9057
22850	7590	08/18/2011		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER ARCIERO, ADAM A	
			ART UNIT	PAPER NUMBER
			1727	
			NOTIFICATION DATE	DELIVERY MODE
			08/18/2011	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

### Office Action Summary

**Application No.**

10/578,570

**Applicant(s)**

HOCEVAR ET AL.

**Examiner**

ADAM A. ARCIERO

**Art Unit**

1727

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 April 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 25-31, 34-41 and 43-47 is/are pending in the application.
- 4a) Of the above claim(s) 25-31 and 34-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 41 and 43-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 05/05/06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**ION-CONDUCTING COMPOSITE MEMBRANES**

Examiner: Adam Arciero      S.N. 10/578,570      Art Unit 1727      August 11, 2011

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of Group II, claims 40-41 and 43-47 in the reply filed on May 26, 2011 is acknowledged. The traversal is on the ground(s) that a search for the subject matter of the claims of Group I and Group II are drawn to a single embodiment and therefore do not lack unity. This is not found persuasive because Group I and II are different inventions which do lack unity and would create a search burden on the Examiner. They are not drawn to the same embodiment because Group I is a process claim requiring processing steps that are not required for the product of Group II as stated in the restriction requirement.

The requirement is still deemed proper and is therefore made FINAL. Thus, claims 25-31 and 34-49 are withdrawn from consideration.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 45 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 45 recites the limitation "the hydrolysable organic precursor of silica" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 40-41 and 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hennige et al. (US 2004/0038105 A1) in view of Goedel et al. (US 6,953,634 B2).

As to Claim 40 and 47, Hennige et al. discloses an ion-conducting composite membrane comprising a polymer matrix containing silica and a low-melting point salt (paragraph [0019], [0024], [0028], [0032] and [0037]). The membrane of Hennige et al. conducts ions from one end of the structure through the other end of said structure, thereby comprising ion-conducting channels. Hennige et al. does not specifically disclose the use of an HPA acid.

However, Goedel et al. teaches of a ion-conducting composite membrane wherein the solvent used is an HPA acid such as phosphotungstic acid (col. 10, lines 15-31). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the membrane of Hennige et al. with an HPA acid solvent, because Goedel et al. teaches that a membrane with excellent proton conductivity and a reduction in swelling can be obtained (Abstract).

As to Claim 41, Hennige et al. discloses a membrane which conducts ions throughout (ion-conducting channels) (paragraph [0014]). Said channels can be measured on the nano-scale.

As to claim 43, Hennige et al. discloses wherein the polymer matrix comprises polysulfones (paragraph [0032]).

As to Claim 44, Hennige et al. discloses wherein the low-melting point salt is imidazolium or pyridinium salts (paragraph [0037]).

As to Claim 45, Hennige et al. discloses the use of organic precursors to silica such as alkoxysilanes (paragraph [0113]).

As to Claim 46, Hennige et al. does not specifically disclose the use of a HPA comprising a member of the family of 12-heteropolyacids.

However, Goedel et al. teaches of a ion-conducting composite membrane wherein the solvent used is an HPA acid such as phosphotungstic acid (family of 12-heteropolyacid) (col. 10, lines 15-31). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the membrane of Hennige et al. with an HPA acid solvent, because Goedel et al. teaches that a membrane with excellent proton conductivity and a reduction in swelling can be obtained (Abstract).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 7am to 4pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on 571-272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ADAM A ARCIERO/  
Examiner, Art Unit 1727

/Barbara L. Gilliam/  
Supervisory Patent Examiner, Art Unit 1727